

**Comment Response Document
Regarding the Total Maximum Daily Loads of Nitrogen for
Three Tidal Tributaries and a Total Maximum Daily Load of Biochemical Oxygen
Demand for One Non-Tidal Tributary in the Newport Bay System
Worcester County, Maryland**

Introduction

The Maryland Department of the Environment (MDE) has conducted a public review of the proposed Total Maximum Daily Loads (TMDLs) of nitrogen for three tidal tributaries and a TMDL of biochemical oxygen demand for one non-tidal tributary in the Newport Bay system. The public comment period was open from November 14, 2002 to December 13, 2002. MDE received four sets of written comments during the comment period. Two additional sets of comments were received following the close of the comment period, which MDE has decided to include in this CRD.

Below is a list of commentors, their affiliation, the date comments were submitted, and the numbered references to the comments submitted. In the pages that follow, comments are summarized and listed with MDE's response.

List of Commentors

Author	Affiliation	Date	Comment Number
Patricia Gleason	U.S. Environmental Protection Agency, Region III	December 13, 2002	1 through 13
Kelly Pogue	Tyson Foods, Inc.	December 13, 2002	14 through 22
Jane Kreiter	Town of Berlin	December 13, 2002	23 through 37
Amy Shellenberger, James R. May, Esq. and James M. Stuhltrager, Esq.	Widener University School of Law, Mid-Atlantic Environmental Law Center	December 13, 2002	38 through 42
Carl Zimmerman	Assateague Island National Seashore	December 16, 2002	43 through 47
John E. Bloxom	Worcester County Commissioners	December 17, 2002	48 through 58

Comments and Responses

1. The commentor asked if MDE considered adjusting the biochemical oxygen demand (BOD) limits or running model sensitivity for BOD, with respect to attaining the DO endpoint.

Response: The BOD TMDL for Newport Bay has been established for only one non-tidal tributary, Kitts Branch. The water quality of the rest of the system is not significantly impacted by external BOD loads. This has been determined by a sensitivity analysis, which is an integral component of the TMDL development process. The sensitivity analysis results

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show that the BOD load reductions to Kitts Branch are required to maintain the DO standard in the future.

2. The commentor asked, with regard to Appendix B, how the nutrient treatment system would affect the balance of nutrient limitation and whether it is possible that the limitation could shift further downstream. The commentor also questioned whether loads were uniformly reduced/increased for the sources during the sensitivity runs. The commentor further asked if a limit on one nutrient for Tyson Foods, Inc. would be adequate under low flow conditions and/or would a minimum N:P ratio need to be maintained as well.

Response: Sensitivity analyses were conducted during the TMDL analysis to assess sensitivity to changes in nutrients, among other things. The sensitivity analyses support field data that show the system is nitrogen limited. The modeling scenarios for the TMDL simulate the future nitrogen reductions under a variety of flow conditions associated with three time periods of the year. The results of these simulations show that the limiting nutrient does not change, and that no adverse affects are shifted to other parts of the system.

3. The commentor suggested showing the minimum daily dissolved oxygen (DO) in addition to the daily average DO in the model results, thereby providing a more direct evaluation of the results with respect to diurnal fluctuations of DO.

Response: The Newport Bay Estuary Model (NBEM), applied under steady state conditions, can generate estimates of daily minimum DO, daily average DO, or daily maximum DO. Although the model can be set up to generate minimum DO values, the results were found to be inconsistent with field study results developed by Walter Boynton of the University of Maryland. Specifically, when chlorophyll *a* is in the range of the 50 ug/l TMDL water quality endpoint, the diurnal swing is about 1 mg/l. Thus, in areas of the water body where the maximum chlorophyll *a* values are at about 50 ug/l under the TMDL scenario, we used the average output from the model and compared it to 6.0 mg/l, which is the minimum standard DO value of 5.0 mg/l adjusted up by one mg/l. In other areas, where less chlorophyll *a* is predicted, the comparison was made with 5.3 ug/l.

4. The commentor suggested that the report text explain how the Newport Bay nonpoint source (NPS) load allocations and reductions relate to those from the creeks.

Response: MDE will not revise the text to address this point, but will add the comment response document to the TMDL file. The TMDL analysis proposes, based on the assimilative capacity of the waterbody, daily loads that are equivalent to a 45% reduction in the terrestrial NPS load of nitrogen for the entire Newport Bay watershed. These reductions, achieved through nonpoint source best management practices, will reduce average nutrient concentrations in the creeks and therefore necessarily address nutrient loads carried by the creeks to Newport Bay

5. The commentor identified a discrepancy between the proposed concentration limit for Tyson Foods, Inc. cited on page 24 of the main document and the concentration cited on page A14 of Appendix A (i.e., 3.5 mg/l versus 4 mg/l).

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Response: The commenter is correct in the identification of inconsistencies in the report with regard to point source information at two different places. The correct concentration is 4.0 mg/l as presented in the main report. The Appendix A has been corrected to read 4.0 mg/l instead of 3.5 mg/l.

6. The commentor suggested that salinity be included in Table A1.

Response: The information relating to salinity was placed in Table A1.

7. The commentor requested an explanation of the rationale for estimating BOD deoxygenation and mineralization rates.

Response: Initial values of the BOD de-oxygenation and mineralization rates were obtained from the literature and previous modeling efforts within the region. These values were adjusted during the calibration process to obtain a reasonable match of the observed data and the model results. The final values were compared to values in the literature and other studies for appropriateness.

8. The commentor requested confirmation that proposed future allocations are incorporated and adequately represented in the TMDL's waste load allocations for point sources. The commentor also suggested that the basis for the future projections for the point sources be cited.

Response: The TMDLs incorporate future expected flows for all of the point sources in the watershed. The flows for the municipal treatment plants are based on approved water and sewer plans. The flow for industrial facilities are based on existing permits or determined in consultation with facility owners and operators. The Technical Memorandum presents this information in terms of viable discharges that are consistent with the TMDLs. No explicit Future Allocations were proposed for the TMDLs.

9. The commentor requested that all tributaries shown on Figure 1 be identified, if otherwise named (e.g., Marshall Creek and Newport Creek).

Response: Those named tributaries have been so identified in Figure 1.

10. The commentor requested that MDE explain more clearly why only a BOD TMDL (and not also a nitrogen TMDL) is necessary in Kitts Branch. The commentor also requested a clearer explanation why only nitrogen TMDLs (and not also BOD TMDLs) are necessary for the other waterbodies.

Response: TMDLs are established for specific substances when they cause an impairment of a particular water body. The model sensitivity runs show that only Kitts Branch is sensitive to the effects of external BOD loadings. This warrants a BOD TMDL in Kitts Branch.

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Nitrogen does not cause an impairment in Kitts Branch. Thus a nitrogen TMDL is not necessary for Kitts Branch. However, sensitivity runs show that nitrogen affects the rest of the waterbodies in the Newport Bay System. Hence, nitrogen TMDLs have been proposed for the rest of the waterbodies. In addition, because nitrogen loads from Kitts Branch contribute to down stream impairments, the TMDLs for downstream waters impose a limit on nitrogen loads from Kitts Branch.

11. The commentor requested that a discussion related to the estimated 20% reduction in nitrogen deposition via Clean Air Act implementation be included in Section 5.0 (Assurance of Implementation).

Response: A discussion relating to the reduction in nitrogen deposition has been included in Section 5.0 (Assurance of Implementation) of the report.

12. The commentor suggested that MDE expand the explanation regarding why a monthly load is appropriate (as opposed to a daily load), for the different flow regimes (e.g., based on a sudden one-day event such as a storm or point source discharge).

Response: The Code of Federal Regulations (40 CFR 130.2(i)) states that “TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure.” No explicit time period is required.

In this case, however, load limits expressed over a longer time period are more appropriate than daily loads. Although nutrient loads are highly variable nutrients do not have an impact on water quality at the temporal scale of a day; rather, they act over long periods of time. For these reasons, the Department has elected to establish the TMDLs on the timeframes as stated.

13. The commentor questioned how sensitive the model was to the loadings from Kelly Foods, Inc. with respect to the discussion in the Technical Memorandum regarding Newark WWTP and the inclusion of Kelly Foods, Inc.

Response: The Technical Memorandum presents load allocations to all the sources present in the watershed. The sensitivity runs show that the model is almost insensitive to the load from Kelly Foods at its present loading condition.

14. The commentor requested that electronic copies of the WASP model input and output, as well as internal documentation of the modeling that might provide additional insight into the model (e.g., spreadsheets; hand calculations; development of nonpoint source, groundwater, and atmospheric loads, etc.) be made available to Tyson Foods and for public review.

Response: The commentor was advised in writing on December 26, 2002 that MDE has decided to treat this as a Public Information Act (PIA) request and will, pursuant to such a request, produce the requested information.

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15. The commentor requested that the public comment period be extended for a minimum of thirty days to allow for review of the modeling in further detail. If such an extension is not granted, the commentor requested that a public hearing on the matter be held.

Response: MDE has included all the stakeholders and interested agencies from the beginning of the TMDL development process. MDE formally invited all the stakeholders to discuss the future development and any impact that will occur from the TMDL. Four people submitted substantive written comments within the comment period provided.

MDE believes that the 30-day comment period for the proposed TMDLs combined with four additional meetings (April 25, August 7, Sept. 18, and Oct. 9 of 2002) held with all stakeholders (April and Sept.) and two specifically with the commentor's technical staff (August and October) provided ample opportunity for review and preparation of comments. MDE also provided the commentor's technical staff access to the TMDL development process. Accordingly, MDE has denied these requests for an extension of the formal comment period. However, comments can be submitted to EPA during its review process.

MDE must allocate limited resources to the development and submittal of approximately 300 TMDLs around the State over the course of the next seven years and must adhere to a schedule that provides both the opportunity for comment on completed TMDLs and for work on future TMDLs to commence concurrently. This necessitates closing the formal comment period on December 13, 2002 in order to allow adequate time to review comments received by that date and incorporate any amendments, as appropriate, in the final proposed TMDLs submitted to the EPA on or before December 31, 2002. Although the formal comment period is not being extended, MDE remains open to and welcomes further dialogue on this and related matters.

16. The commentor requested a clarification regarding which state variables were used in the model. The commentor further questioned whether an extra state variable was added to simulate salinity.

Response: WASP5.1 uses eight state variables (See Appendix A, A2) within its modeling domain. The WASP5.1 was used separately to simulate salinity to estimate the dispersion coefficients before calibrating the eight state variables (See Appendix A, A3).

17. The commentor questioned whether any field data was used to confirm the literature values for the fluxes of nutrients from the sediment.

Response: No flux measurements were conducted in the Newport Bay System. Flux measurements from the literature and other similar modeling studies were used as a starting point in the calibration of the model. These values were adjusted until a reasonable fit was obtained between the model's results and the water column data.

18. The commentor questioned what portion of the mass budget dispersion represented at the downstream boundary for each state variable.

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Response: The WASP model used presents a steady state solution. As per the calculation under this condition the mass budget predicted from the model is 1.5% for ammonia, while for all other major variables, e.g. BOD, NO₂, ON, PO₄, and OP it is less than 0.5% of the total mass.

19. The commentor stated that the allocation of nitrogen among point sources for the winter flow scenario is not fair, because the allocations were based upon different effluent concentrations (i.e., Tyson Foods was given an allocation based on an effluent total nitrogen concentration of 18 mg/l, while the Town of Berlin WWTP was given a less stringent allocation based on an effluent concentration of 24 mg/l). The commentor requested that the allocations among multiple point sources be based instead on similar effluent concentrations.

Response: The calculation of a TMDL is tailored to how individual pollutant sources contribute to the system such as their location and the timing of their discharges, the special circumstances of the pollutant sources, and the resulting effects on water quality.

These factors were considered in the determination of the TMDL allocations and outlined through a series of stakeholder meetings. The State reserves the right to reallocate the loads at any time in the future through a process that will continue to involve all interested stakeholders. The commentor's concerns can therefore be addressed in such future reallocation processes.

20. The commentor expressed that although there are significant loadings from point and nonpoint sources, it should be expected that each would reduce their pollutant loadings. The commentor further expressed that they feel they have already contributed to the reduction of the pollutants involved and state that in order to reduce further would be too costly after all of the other reductions that have taken place.

Response: When making allocations, the State of Maryland is sensitive to past investments made by stakeholders. TMDLs are calculated based on the effects of all loads in the system, whether they are point or nonpoint sources. The NBEM was used to determine that a 45% reduction of nonpoint source loads was necessary throughout the system, which is a significant reduction (See Comment 4). The shallow Newport Bay is extremely sensitive to nutrient loads, and thus limits the options that are available. Nevertheless, Maryland reserves the right to modify the allocations, and phase the implementation, if warranted by special circumstances.

21. The commentor requested that the allocation to Kelly Foods, Inc. during winter months be reallocated to other sources in order to decrease the reductions required of other sources, since Kelly Foods, Inc. has not discharged effluent for at least one year and has no immediate plans to resume discharging.

Response: The allocation to Kelly Foods was based on its current permit. If the permit is revoked, for example, Kelly Foods' portion of the allocation may be redistributed. (See response to Comment 19).

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22. The commentor requested that MDE acknowledge the reductions that have taken place since 1997 land use and the 1993 nutrient loading studies were performed through numerous activities (e.g., the use of feed additives and/or voluntary nutrient discharge activities and nutrient management planning).

Response: The estimated reduction in the annual loading that is necessary to meet the TMDL goal was based on the 1997 landuse, adjusted by current Farm Service Agency (FSA) data, and 1993 nutrient loading rates. The purpose of the TMDL analysis is to determine the maximum allowable load from all sources, and to allocate those loads to point and nonpoint sources. Estimating the current load, and the reduction needed to meet the TMDL, is not a requirement of the TMDL analysis. Maryland provides the initial estimate of the necessary nonpoint source reduction as a good faith effort towards future implementation. MDE acknowledges that some progress towards meeting the nonpoint source reduction goal might have occurred already. Similarly, it is conceivable that some nonpoint source loads have increased. Improving the estimate of “current” loads will be one of the on-going challenges associated with implementing TMDLs.

Although formal implementation planning is currently beyond the scope of the TMDL development process, Maryland is committed to enforcing applicable laws and supporting voluntary initiatives necessary to implement this and other TMDLs. Maryland has several well-developed programs to draw upon as part of future implementation efforts. These include the State Water Quality Improvement Act of 1998, the federal Clean Water Action Plan framework, and the Comprehensive Conservation and Management Plan for Maryland’s Coastal Bays.

23. The commentor requested a meeting with MDE staff to discuss their comments before any further action is taken on this proposed TMDL.

Response: MDE is willing to meet with the commentor prior to the Dec. 31 submission date, but the commentor has suggested that because of the season that schedule may not be possible. MDE must submit the TMDL to EPA by Dec. 31 under its agreed upon schedule but is nonetheless available to meet with the commentor at any time. MDE believes that the 30-day comment period for the proposed TMDLs combined with two additional meetings (April 25 and Sept. 18) held with all stakeholders provided ample opportunity for review and preparation of comments.

The commentors have expressed concerns that appear to relate more to implementation issues than directly to technical aspects of the TMDL. MDE believes that the TMDL implementation process provides sufficient flexibility to address the commentor’s concerns.

24. The commentor expressed concern that the TMDL does not propose any loadings for the Berlin WWTP during the summer months. Although the plant relies on land application of the effluent during these months, the commentor stated that the TMDL should be reevaluated to determine whether summer loadings can be made available to the plant in the event that discharge to the stream is warranted in the future.

Response: TMDL allocations are based on the effects of individual source to the system (See also the response to Comment 19, Comment 25, and Comment 45). In order for Berlin to discharge during summer, it would be necessary for the town to build a completely new WWTP. It was our understanding that such a decision was not forthcoming, thus we made the allocations assuming the City's current treatment ability. If the city contemplates a major plant upgrade, the department would consider making revisions to the TMDL allocations.

25. The commentor stated that extensive marshes and a network of drainage ditches exist in the upper Newport Bay, which would have an impact on the dissolved oxygen concentration; however, the impact of these features is not clearly accounted for in the model. The commentor expressed concern regarding this matter and stated that they "will not have any confidence in the results until this issue is addressed".

Response: The model was not set up to explicitly simulate the processes noted by the commentor; however, these factors were considered in the analysis. The effects of drainage ditches are likely to be reflected in observed watershed loads, ground water loads, and in the average annual loading rates developed by the University of Maryland. The effects of the marshes were considered in the calibration process. To some degree they are compensated for in the other model parameters, such as the bottom sediment properties. These implicit means of addressing the watershed features noted by the commentor are currently standard practice among regulatory decision makers.

The State of Maryland is charged with making timely decisions on the basis of the best readily available data and analytical tools. Although the current model has limitations, it is a sufficient decision-support tool. The State is willing to entertain proposals for sharing the costs associated with the development of a refined set of data and a refined model in the years to come.

26. The commentor stated that the model should have been in dynamic mode to properly address the highly variable nature of algal impact on DO.

Response: The TMDL analysis was conducted using the best readily available data and analysis tool. Within the limitations of the data and analytical tools available for this analysis, the diurnal variability of DO, due to the presence of algae, was addressed. See also the response to Comment 3 and Comment 25.

27. The commentor stated that the calibration graphs in Appendix A show a poor calibration for DO, underestimating DO by 2 to 4mg/l for most reaches. The commentor expressed concern that these calibrations indicate a problem with the model.

Response: The primary focus of this modeling effort was to assess the effects of nutrients and BOD of the Newport Bay System. The models are used to support making management decisions in a consistent manner from place to place. The calibration plots for the mainstem of the river are reasonably accurate, and support results that are consistent with regulatory decision-making methods used elsewhere in Maryland. For all model output parameters in

the calibration of the model, the simulated water quality captures the trend in the observed data.

Models are not perfect, as there are always some parameters that are oversimulated or undersimulated. The key is to follow the trend of the observed data and to be inside a reasonable data range.

28. The commentor stated that the Wetzel, 2001 reference regarding nutrient limitation ratios cited in the report has been misinterpreted. The commentor stated that the ratios cited in the reference may be looked upon only as a potential for limitation, and do not provide confirmation that nutrient limitation is actually taking place. The commentor added that the data and modeling runs presented show there were sufficient concentrations of both nitrogen and phosphorus present in the water column during the growing season to allow the calculation of the ratios presented in the citation; however, under a nutrient limited condition, measurable concentrations of the limiting nutrient would not be expected to be present (or at least not at the concentrations presented in the report).

Response: The provided reference is just a guideline for how nutrient limitation takes place and the calculation presented in Table A is a general view of how nutrient limitation is observed in the field data. However the nutrient limitation as mentioned in Appendix B has not been used to determine the limitation in the model. (See Comment 29)

29. The commentor expressed the belief that phytoplankton growth in much of the Newport Bay system is actually being limited by some factor other than nitrogen or phosphorus (e.g., light limitation, which is common in shallow tidal bays and creeks with associated marshes). The commentor stated that MDE should investigate this possibility, because the analysis fails if a nutrient limitation does not exist.

Response: There are various factors that affect nutrient limitation. The major factors are nitrogen, phosphorus and light. The model is not built on the assumption that any of these factors is limiting phytoplankton growth. Instead, these variables are used in the model to calculate the phytoplankton growth rate. Sensitivity analyses, conducted using the model, demonstrated that the system is nitrogen limited. These model sensitivity analyses are consistent with, and provide some confirmation, that the nutrient limitation analysis results based on the observed data are correct. Nitrogen limitation is most commonly found in estuarine and marine systems, while freshwater systems such as lakes tend to be phosphorus limited.

30. The commentor stated that although the report recognizes that “only the DIN:DIP ratio by itself is not sufficient to establish which nutrient will be limiting” and the model was run for confirmation, the model was built on the assumption that the system was nutrient limited. The commentor stated that the model concluding that the system is nutrient limited is the only answer it could give based on the assumptions going into the model, as it does not allow for the possibility that the system is not limited by the two major nutrients.

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Response: The NBEM itself is not built on the assumption that a particular nutrient is limiting phytoplankton growth. The DIN:DIP ratio was used to calculate the potentially limiting nutrient in the system in post-processing the model results. The system as a whole happens to be nutrient (nitrogen) limited, and this is based entirely on model sensitivity runs. The results from the model are generally supported by the data.

31. The commentor is concerned that it may be difficult to force the system into nitrogen limitation. The commentor added that forcing the system into nitrogen limitation will actually cause more damage due to the growth of blue-green algae leading to extensive surface mats.

Response: MDE believes that no forcing will be necessary. The data, the results from the calibration of the model, and the TMDL scenario runs all show that the system is nitrogen limited. The system is presently nitrogen limited and there are no documented signs of extensive surface mats of algae.

32. The commentor stated that document should have included an analysis to see if the DO standard of 5 mg/l is attainable under natural conditions or whether the low DO is due partially to natural conditions. The commentor noted that the Code of Maryland Regulations (COMAR) provides for standards not being attainable, due to natural conditions.

Response: Since a feasible reduction of anthropogenic pollutant loads will result in attaining water quality standards, it would be difficult to justify a natural conditions exception to the dissolved oxygen criterion.

33. The commentor questions whether the agency was simply in too much of a hurry or did not have adequate resources to complete the TMDL study correctly. The commentor noted that the Newport Bay model was run against a targeted DO concentration of 6.0 mg/l, rather against the standard of 5.0 mg/l. The commentor stated that the model should be corrected to run in dynamic mode with the results directly compared to the 5mg/l standard, as this cannot be modeled directly in steady-state mode for eutrophication. The commentor noted that the DO standard is the minimum allowable concentration at any time, and reiterated that the model results do not provide any information relative to this standard (i.e., the additional 1.0 mg/l is felt to be an arbitrary and undocumented adjustment).

Response: MDE must allocate limited resources for the development and submittal of approximately 300 TMDLs around the State over the next seven years. While this schedule places extraordinary demands on MDE staff and the resources available to the Department in development of such analyses, MDE does not attempt to “hurry” such calculations. In this case, as in other TMDLs, the data was available to support the development of a credible model, which could be used to calculate TMDLs for Newport Bay. MDE therefore took advantage of this opportunity.

MDE does not believe that its methodology is arbitrary. The method was based on the work of Dr. Walter Boynton, of the University of Maryland, which is well documented in the TMDL report.

34. The commentor stated that the report does not address the likelihood that BOD impacts during high flow and lower temperatures may be minimal relative to those expected during the summer.

Response: The TMDLs for BOD during low flow and high flow are themselves representative of the effects of higher flows and lower temperature. At higher flow months the limits are higher, whereas during lower flow months they are lower. The TMDL analysis includes variation of flows and temperatures, which are reflected in the study results.

35. The commentor stated that the origin of the $< 50 \mu\text{g/l}$ chlorophyll goal is not indicated in the report, nor does the report justify this goal or its actual attainability.

Response: The chlorophyll *a* level is based on the designated uses of Newport Bay, guidelines set forth by Thomann and Mueller (1987) and by the EPA Technical Guidance Manual for Developing Total Maximum Daily Loads, Book 2, Part 1 (1997).

36. The commentor stated that Table A1 in Appendix A inappropriately lists some instrument or measurement ranges as detection limits.

Response: All the detection limits presented in the Table A1 are based on published UMD –Chesapeake Biological Laboratory protocols. It would have been helpful to the Department if the commentor had indicated which parameter they have particular concerns with, but most all parameters listed match published data, both for in-situ measurements and analytical chemistry.

37. The commentor stated that Figure A7 in Appendix A suggests that the model was calibrated to many results below 2.0 mg/l, below the calculation limits for BOD. The commentor asks where this data came from and whether any QA/QC was applied to all of the data.

Response: All the data received from laboratories (CBL/DHMH) are received in the MDE field office in Annapolis. Field office staff perform QA/QC checks on these data to see if normal ranges are present. All the BOD data seen below 2 mg/l are the actual values reported by the lab.

38. The commentor stated that the BOD TMDL for Kitts Branch does not ensure compliance with water quality standards and is not consistent with the Clean Water Act because the allocations exceed the current measured Spring and Summer loadings to the waterbody indicated by MDE's data (i.e., the proposed Spring flow allocation is 204 lbs/day, which is greater than the 100.3 lbs/day current typical loading; likewise, the proposed Summer flow allocation is 46 lbs/day, which is greater than the current typical loading of 27.96 lbs/day).

Response: The proper comparison to make is between the TMDL and baseline load, which is the maximum permit threshold load. The TMDL proposes to decrease the allowable BOD load, compared to what is currently in the NPDES permit for Tyson Foods (baseline).

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Regulated facilities discharge at levels that are significantly lower than their permitted level in order to avoid risk of mandatory penalties. Thus, the TMDL will result in discharges that are lower than the current typical loading.

39. The commentor noted that the Newport Bay System is also listed as impaired by fecal coliform bacteria. The commentor stated that, while the TMDL document at issue was developed to address nutrients, the fecal coliform impairment should also be addressed in order to meet water quality standards associated with the waterbody's designated use (*Use II – Shellfish Harvesting Waters*), as "elevated levels of fecal coliform represent the biggest threat to shellfish harvesting".

Response: Although some of the investigative work needed to develop fecal coliform TMDLs has been performed as part of the TMDL development for nutrients, the analysis methodologies for addressing nutrients and fecal coliform are substantially different. For this reason, the fecal coliform TMDL analyses could not be performed at this time. In order to assure progress is being made toward addressing as many water quality standards attainment issues as rapidly as possible, the Department chose to complete the nutrient TMDLs first, rather than waiting until the fecal coliform TMDLs are completed sometime in the future.

40. The commentor stated that the draft TMDL is insufficient because it does not contain an adequate margin of safety (MOS) for nitrogen (i.e., because MDE does not have accurate information on nonpoint source loads of nitrogen, a 5% MOS of these loads does not adequately account for uncertainty and is not sufficient to ensure environmental protection).

Response: TMDLs are required to include a MOS to account for uncertainties in a manner that is conservative toward protecting the environment. There are no strict guidelines or methodologies provided by the EPA for selecting a MOS, except to suggest that a MOS may be an explicit value held aside or conservative assumptions built into the analysis. The MOS proposed in this TMDL analysis is based on other TMDLs approved by EPA and was adopted in consideration of built-in conservative assumptions of the analysis. The MOS for the TMDL was selected with the understanding that the analysis and the MOS may be revised in the future as better information comes available.

41. The commentor stated that TMDL does not include an implementation plan, which the commentor believed is incorrect for two reasons: 1) MDE has not explained exactly how the load allocations contained in the document will be implemented to meet Maryland's water quality standards and 2) MDE has not proposed a timetable to implement the draft TMDL or establish a date-certain deadline for the achievement of water quality standards.

Response: The purpose of a TMDL analysis is limited to determining the maximum loading limit that meets existing water quality standards. Neither the Clean Water Act nor current U.S. Environmental Protection Agency regulations direct states to develop a detailed implementation plan as part of the TMDL development and approval process. Although formal implementation planning is currently beyond the scope of the TMDL development process, Maryland is committed to enforcing applicable laws and supporting initiatives

necessary to implement this and other TMDLs. Maryland has several well-developed programs to draw upon as part of future implementation efforts. These include the State Water Quality Improvement Act of 1998, the federal Clean Water Action Plan framework, and the Comprehensive Conservation and Management Plan for Maryland's Coastal Bays.

42. The commentor noted appreciation for the manner in which the TMDL was developed. The commentor stated that the TMDL staffs were consistently receptive to new data, questions and ideas from the National Park Service and others throughout the development process.

Response: MDE places a high priority on stakeholder input and involvement in the development of its TMDLs. MDE makes every reasonable effort to ensure that all the interested parties and stakeholders have the opportunity to participate.

MDE appreciates all the involved parties in the development of this TMDL. The development of this TMDL is the result of coordination with all the stakeholders and the agencies involved. MDE notes, however, that scheduling requirements place some limitations on the extent and duration of this process.

43. The commentor expressed concern that the magnitude of reduction anticipated by the TMDL in nonpoint sources (NPS) is overly optimistic. The commentor cited the following reasons for this concern: 1) most of the NPS loading occurs in times of low temperature and biological activity, limiting biological sequestration; 2) many of the NPS programs are mostly based on voluntary activities and lack proven track records and enforcement mechanisms thus success is uncertain; 3) significant population growth is expected in the watershed over the next decade; and 4) atmospheric deposition of nutrients in the Delmarva region has not exhibited a significant downward trend over the past decade.

Response: (1) Biological sequestration is accounted for in the models, when nonpoint source loads are estimated. That is partly why, for example, loads from forested lands are less than those from barren or cultivated lands. Removal of nitrogen by riparian buffers for example is a best management practice that would provide for biological sequestration. It can be applied as a best management practice and the annual reduction in load counted to achievement of the TMDL. (2) There are two issues here: the first is that NPS programs are voluntary and the second is that success is uncertain. As to the first point, MDE considers incentive-based implementation as critical to nonpoint source pollution success. Programs such as CWA section 319, EQUIP, CREP, and others will enable those NPS reductions. The uncertainty will be reduced as implementation and future evaluation of success proceeds. (3) How and where growth takes place and the effect of that growth is in part controllable by planning and zoning, adequate facilities ordinances and permits for erosion and sediment control and stormwater management. To avoid the need for even more stringent TMDLs to meet water quality standards, all necessary control points to limit additional pollutant loads should be used. (4) The primary programs to accomplish reduction of atmospheric deposition have not been fully implemented yet.

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44. The commentor stated that it is important to implement a long-term monitoring strategy to assess trends in NPS loading as soon as possible, with a specific timetable for review and adjustment of the NPS loadings within the context of the overall TMDL.

Response: We concur with the commentor's assessment. We envision participating in future monitoring efforts involving multiple State agencies, local governments, and the Maryland Coastal Bays Program. It is our hope that the Maryland Coastal Bays Program can play a leadership role in bringing all interested parties together in this endeavor. Maryland will also consider this comment in future efforts to refine the State's Water Quality Management Strategy. This will be done in coordination with EPA's "Program Integration" initiative, which seeks to promote more efficient use of limited resources to improve the basis of regulatory decision-making.

Water quality monitoring in this region is scheduled by MDE in 2003. 2002 represents the end of the cycle for MDE's Five-Year Watershed Cycling Strategy for monitoring. The monitoring cycle began on the Lower Delmarva Peninsula in 1998, thus monitoring in 2003 on the Lower Delmarva Peninsula represents the first repeated monitoring of a basin under MDE's Watershed Cycling Strategy. We encourage others to coordinate their monitoring efforts with MDE's Technical and Regulatory Services Administration during the next year to enhance the utility of the available monitoring resources for future purposes.

45. The commentor voiced agreement that Tyson Foods appears to be the most feasible target for implementation of improved nutrient reduction technologies; however, the commentor stated that it is also necessary to consider reductions in load allocation for the Berlin WWTP. The commentor recommended that implementation plans target a permitted load allocation for the Berlin WWTP of 1.2 mgd at 18 mg/l total nitrogen during the winter and Tyson Foods at 800,000 gpd at 18 mg/l total nitrogen during the winter, 8 mg/l total nitrogen in the spring and 3.5 mg/l total nitrogen during the summer.

Response: MDE respects the commentor assessment. The TMDL specifically does not address only Tyson Food but also the Berlin WWTP, as needed. The proposed TMDL adequately reduces loads from both the sources. Hence, the given allocation is justified. See Response to Comment 19.

46. The commentor expressed concern regarding the timing of any changes in NPDES permit conditions governing nitrogen discharges for Tyson Foods and the Berlin WWTP. The commentor noted that the reductions in the point sources come at a time when Town of Berlin is anticipating an increased demand in wastewater treatment, and stated that it is inappropriate to allow any increases in winter discharge volumes (and hence loading rate) of the Berlin WWTP until proportional reductions in overall loadings are achieved by technology improvements at either (or both) the Berlin or Tyson Foods facilities. The commentor also stated that at no point in the future should permit conditions allow overall loading rates to Newport Bay increase.

Response: The TMDL development considered all the point sources at the critical condition of flow and loads. The TMDL analysis does take into account the increase in flow of the

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Berlin WWTP as presented in the proposed TMDL for the Newport Bay System. For a poorly flushed system, such as Trappe Creek of Newport Bay, the increase in flow is often advantageous provided the overall load does not exceed desired levels.

47. The commentor expressed concern that the data used in modeling effort for these TMDLs does not provide a complete picture of the current status and long-term trends of the water quality in the Coastal Bays. The commentor stated that factors exist (e.g., groundwater and sediment pollutant loading), which have significant lag periods before their effect on water quality occurs; therefore, significant efforts could be made to address point and nonpoint loadings and result in little impact on monitored results.

Response: The TMDL document provides sufficient data to verify the impairments for which the TMDLs are developed. The modeling effort used the most recent data to refine the model used for the TMDL analysis. Historic data was considered; however, the technical work group assembled to advise on the TMDL development felt it was of little value to the TMDL analysis. It was not the purpose of this study to compile and present information in as comprehensive a manner as cited by the commentor. The comment, however, is noteworthy and will be shared with staff at the Department of Natural Resources, and the Maryland Coastal Bays Program in an effort to determine if there is sufficient interest to devote the resources needed to perform an analysis of the kind noted by the commentor.

48. The commentor stated that factors (i.e., groundwater and sediment pollutant loadings) exist, which have significant lag periods before their effect on water quality occurs. Therefore, the commentor requested that impacts of groundwater and sediment pollutant loadings be fully assessed and given appropriate weight in all progress assessments.

Response: The commentor makes an important point for the public record. Nutrient laden groundwater can take many years to reach surface water bodies. Thus, the negative effects of nutrient laden groundwater on surface water quality can persist for many years after sufficient nutrient controls have been implemented. A similar phenomenon can occur with legacy sediments working their way down a stream many years after sediment controls have been affected.

This observation by the commentor is one reason that the initial phases of implementation plans typically emphasize tracking progress on implementing nutrient reduction actions. Associating an estimate of nutrient reduction with each control action, and keeping a tally of the control actions can gauge an overall estimate of progress. These considerations should be factored into the implementation and evaluation process.

49. The commentor expressed concern that “base” or background loadings for NPS – a critical component in designing an implementation strategy – was referred to by MDE staff as the weakest link in TMDL assessment of pollutant sources.

Response: It is essential in understanding the TMDL concept, as it applies in this case, to recognize that the baseline load has no role in determining the maximum allowable load that

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the waterbody can receive and still meet standards. The TMDL is a number that roughly equals how much of the polluting substance can go into the water. The baseline load estimate is the number that roughly corresponds to how much is currently going into the water. Even if we had no knowledge of the baseline, we could estimate the TMDL. This is to say, the TMDL document could technically be submitted and approved by EPA with no estimate of the baseline. However, because we recognize the value of placing the TMDL into context, and of beginning the dialogue on implementation, MDE has provided an estimate of the baseline load. If the baseline loading estimate is too high, then the percent reduction needed to reach the TMDL is lower than what has been reported. The reverse is true if the baseline loading estimate is too low. In either case, the TMDL is the pollutant loading that will allow the water quality standards to be achieved and is not dependent on current loads.

50. The commentor requested notification of and access to all independent and governmental assessments of the modeling techniques used to develop the TMDLs. Additionally requested was the ability to submit comments and participate in future review and refinements of modeling procedures.

Response: A good faith effort will be made to assure notification; however, the Department cannot guarantee notification in perpetuity. The Department can provide TMDL materials that are releasable under the Maryland Public Information Act (§10-611 to §10-628 of the State Government Articles).

51. The commentor questioned to what extent the TMDLs will become a regulatory instrument.

Response: TMDLs do not develop new regulations, but rather provide a tool to guide the implementation of existing laws and regulations. Through the National Pollutant Discharge Elimination System (NPDES) permit process, point sources will be allocated part of the TMDL through enforceable water quality-based discharge limits. Nonpoint sources will be expected to implement their loading allocation through voluntary incentive programs for best management practices or other existing statutes or programs. TMDLs will also generate data and information that can be used to assist locally led watershed protection efforts. TMDLs also will inform lawmakers and regulators in considering the need for additional regulatory or nonregulatory programs for point or nonpoint source pollution.

52. The commentor questioned what role Worcester County will be required to play in TMDL enforcement.

Response: Maryland is committed to enforcing applicable laws and supporting voluntary initiatives necessary to implement this and other TMDLs, and anticipates that Worcester County is equally committed to this effort.

53. The commentor questioned what impact the TMDLs will have on development amount, intensity, location, and timing of Worcester County's implementation of the Comprehensive Conservation and Management Plan for Maryland's Coastal Bays (CCMP).

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Response: The question involves detailed implementation issues, which are beyond the scope of the TMDL analysis. (Please also see the response to Comment 42 above.) The TMDL document cites the CCMP in support of reasonable assurance of implementation.

54. The commentor questioned whether litigation associated with the implementation of TMDLs should be expected.

Response: As of December 2002, the Department has no knowledge of litigation planned, or being considered, in regard to these TMDLs. The Maryland Administrative Procedures Act does not afford a right to judicial review of a TMDL until it is used as the basis for developing permit limits or certain other regulatory controls. It is inappropriate for the Department to speculate as to the likelihood that such implementation measures will be challenged through litigation.

55. The commentor questioned whether sufficient flexibility exists to amend the TMDLs as new information becomes available.

Response: The federal TMDL regulations are sufficiently flexible to allow for revisions if warranted by new information or new analytical tools.

56. The commentor questioned whether sufficient information and/or research exist regarding corrective techniques (e.g., BMPs) for nonpoint sources to develop an effective strategy to address such sources. The commentor additionally questioned whether sufficient management techniques exist to meet the proposed TMDL standards, given the significant influence of atmospheric deposition and groundwater contribution to pollutant loads (and the limited influence of humans over such contributions to water quality).

Response: Sufficient information is available to develop reasonably effective nonpoint source management action strategies. Where greater uncertainty exists, an adaptive management approach may be taken. This involves implementing incremental, common sense management measures in an iterative manner and evaluating their effectiveness in each iteration.

57. The commentor questioned whether additional measures exist to realize significant nutrient loading reductions to meet the TMDLs, given that point sources in the watershed are limited and already using best available nutrient reduction technologies, the agricultural community within the watershed has one of the highest BMP implementation rates, and recent improvements to sediment and erosion control and stormwater management regulation have all been implemented.

Response: The commentor raises worthwhile issues to pursue during future discussions regarding implementation. The purpose of a TMDL analysis is to determine the maximum loading limit that meets current water quality standards. It is a goal-setting analysis. Moreover, although the analysis considers possible implementation scenarios in order to provide assurance that the TMDL can be achieved, the TMDL does not determine 'how' to reach that goal.